

Application Serial No. 10/601,745

REMARKS

The Applicant and the undersigned thank Examiner Bello for his careful review of this application and especially for his time and consideration given during the telephonic interview conducted on September 8, 2005. A summary of this telephonic interview is provided below.

Claims 12-18 have been rejected by the Examiner. Upon entry of this amendment, Claims 1-11 and 19-30 have been cancelled while Claims 12-18 remain pending in this application. The independent claim is Claim 18.

Consideration of the present application is respectfully requested in light of the above claim amendments to the application, the telephonic interview, and in view of the following remarks.

Summary of Telephonic Interview conducted on September 8, 2005

The Applicant and the undersigned thank Assistant Examiner Bello for his time and consideration given during the telephonic interview of September 8, 2005. During this telephonic interview, the Applicant's representative and the Examiner discussed a proposed amendment that was sent to the Examiner for discussion purposes.

The Applicant's representative explained that U.S. Pat. No. 6,707,024 issued in the name of Miyamoto et al. (hereinafter, the "Miyamoto reference") and U.S. Patent No. 6,740,861 issued in the name of Matsuda (hereinafter, the "Matsuda reference") do not teach every element of amended independent Claim 12.

Specifically, it was pointed out to Assistant Examiner Bello that the Miyamoto and Matsuda references do not teach: (1) the automatic gain control circuit comprising a first amplifier for comparing voltages and (2) a limiting circuit that can convert the electrical signals from the detecting circuit to data signals by adjusting a time constant according to the predetermined frequency; and (3) a limiting circuit comprising a second amplifier.

It was discussed how the Examiner interprets the auto-bias circuit 30 of Figure 15 of the Miyamoto reference as performing the same function of the claimed automatic gain control circuit. It was also discussed how the Examiner also interprets the bias control circuit 12 of Figure 15 of the Miyamoto reference as performing the same function of the claimed limiting circuit.

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The Applicant has amended the claims to further describe the functions as well as further describing the corresponding structures of the automatic gain control circuit and limiting circuit as illustrated in Figure 13 of the pending application. These functions of the automatic gain control circuit and limiting circuit are clearly different and patentable over the auto-bias circuit 30 and bias control circuit 12 of Figure 15 of the Miyamoto reference.

Examiner Bello acknowledged that he understood the differences between the prior art of record and the proposed amended claims as pointed out by the Applicant's representative. Examiner Bello also noted that the steps provided in the claims did not appear to be clearly linked with one another. The Examiner suggested that the Applicant amend the claims to further describe how one step may be linked to the next. Examiner Bello then agreed to conduct an update search for the invention as described by amended independent Claim 12 when the Applicant submits Claim 12 in a formal response.

The Applicant notes that additional changes have been made to the claims by the Applicant after the telephonic interview of September 8, 2005. These changes have been made in response to the Examiner's suggestions. The Applicant notes that the following changes to Claim 12 were made in response to the Examiner's suggestions (underlines denote additions):

- (1) an automatic gain control circuit coupled to the detecting circuit; and
- (2) receiving electrical signals from the detecting circuit with a limiting circuit.

The Applicant and the undersigned request Examiner Bello to review this interview summary and to approve it by writing "Interview Record OK" along with his initials and the date next to this summary in the margin as discussed in MPEP § 713.04, p. 700-202.

Claim Rejections Under 35 U.S.C. §§ 102(e) and 103

The Examiner rejected Claim 12 under 35 U.S.C. § 102(e) as being anticipated by the Miyamoto reference. The Examiner rejected Claims 13-15 under 35 U.S.C. § 103(a) as being unpatentable over the Miyamoto reference. And lastly, the Examiner rejected Claims 16-18 under 35 U.S.C. § 103(a) as being unpatentable over the Miyamoto reference in view of the Matsuda reference.

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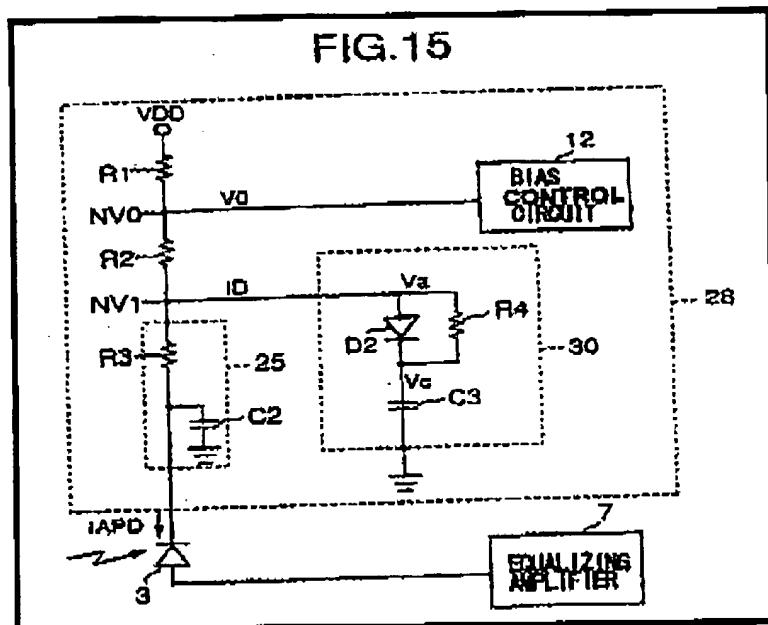
The Applicant respectfully offers remarks to traverse these pending rejections. The Applicant believes that the amended independent claim is patentable over the prior art of record.

Independent Claim 12

The rejection of Claim 12 is respectfully traversed. It is respectfully submitted that the Miyamoto and Matsuda references fail to describe, teach, or suggest a combination of (1) receiving an optical signal that is formatted according to (2) a network protocol and (3) predetermined timing scheme and (4) having a predetermined encoding scheme that provides transitions per code group of data to facilitate clock recovery; (5) increasing a speed in which a detecting circuit can receive and convert optical signals to electrical signals by (6) adjusting a time constant of the detecting circuit according to (7) a predetermined frequency of the data that is dependent upon the network protocol and encoding scheme; (8) increasing a speed in which an automatic gain control circuit (9) coupled to the detecting circuit can adjust gain between different optical signals received (10) by the detecting circuit (11) by adjusting a time constant according to the predetermined frequency, (12) the automatic gain control circuit comprising a first amplifier for comparing voltages; (13) receiving electrical signals from the detecting circuit with a limiting circuit; and (14) increasing a speed in which the limiting circuit can convert the electrical signals to digital data signals by (15) adjusting a time constant according to the predetermined frequency, (16) the limiting circuit comprising a second amplifier, as recited in amended independent Claim 12.

The Miyamoto Reference

The Miyamoto reference describes a circuit diagram in Figure 15 that illustrates a time constant switching type auto-bias circuit 28. This time constant auto-bias circuit 28 has a time constant that determines a tracking speed of a bias-voltage VAPD to a change of an optical power inputted into a photodetector 3. The photo detector 3 includes an APD, and a time constant that determines a tracking speed of a voltage V0 of node NV0. The Miyamoto reference explains that it is necessary to set up time constants such that the bias-voltage VAPD may not exceed a breakdown voltage VB when an optical power inputted into the photodetector 3 changes from a maximum light-receiving level to 0.



Therefore, an electric current I_{APD} that flows through the photodetector 3 may not exceed a maximum rating electric current of an equalizing amplifier 7. See the Miyamoto reference, column 7, lines 51-68 and column 8, lines 1-35 in Figure 15 reproduced above.

As noted by the Examiner, the Miyamoto reference adjusts time constants based on power. Further, one of ordinary skill in the art recognizes that auto-bias circuit 28 and bias control circuit 12 of the Miyamoto reference cannot be reasonably be interpreted as an automatic gain control circuit and claimed limiting circuit, especially in light of the structural differences now present in the amended independent claim.

Specifically, independent Claim 12 now recites increasing a speed in which a detecting circuit can receive and convert optical signals to electrical signals by adjusting a time constant of the detecting circuit according to a predetermined frequency of the data that is dependent upon the network protocol and encoding scheme; increasing a speed in which an automatic gain control circuit coupled to the detecting circuit can adjust gain between different optical signals received by the detecting circuit by adjusting a time constant according to the predetermined frequency, the automatic gain control circuit comprising a first amplifier for comparing voltages; receiving electrical signals from the detecting circuit with a limiting circuit; and increasing a speed in which the limiting circuit can convert the electrical signals to digital data signals by

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adjusting a time constant according to the predetermined frequency, the limiting circuit comprising a second amplifier.

The Matsuda Reference

The Examiner admits that the Miyamoto reference does not teach increasing the speed of a receiver by decreasing the capacitance and thereby decreasing the time constant. To make up for the deficiency of the Miyamoto reference, the Examiner relies upon the Matsuda reference.

The Matsuda reference mentions in its background section that known structures exist in the art to reduce the pad capacitance of photodiode. Specifically, a thick insulating film of polyimide can be interposed between an electrode pad and a semiconductor layer. To further reduce or eliminate pad capacitance, another known structure can be used such as a mesa-shaped light-absorbing layer on part of a semi-insulating semiconductor substrate. See the Matsuda reference, column 1, lines 26-45.

However, the Matsuda reference is increasing the frequency response of a photodetector which does not relate in any way to adjusting a time constant of an automatic gain control circuit. Also, similar to the Miyamoto reference, the Matsuda reference does not provide any teaching of adjusting time constants according to a predetermined frequency of the data that is dependent upon the network protocol and encoding scheme.

Like the Miyamoto reference, the Matsuda reference fails to teach the combination of increasing a speed in which a detecting circuit can receive and convert optical signals to electrical signals by adjusting a time constant of the detecting circuit according to a predetermined frequency of the data that is dependent upon the network protocol and encoding scheme; increasing a speed in which an automatic gain control circuit coupled to the detecting circuit can adjust gain between different optical signals received by the detecting circuit by adjusting a time constant according to the predetermined frequency, the automatic gain control circuit comprising a first amplifier for comparing voltages; receiving electrical signals from the detecting circuit with a limiting circuit; and increasing a speed in which the limiting circuit can convert the electrical signals to digital data signals by adjusting a time constant according to the predetermined frequency, the limiting circuit comprising a second amplifier, as recited in amended independent Claim 12.

In light of the differences between amended Claim 12 and the Miyamoto and Matsuda references, one of ordinary skill in the art recognizes that the broadest, reasonable interpretation

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of the Miyamoto and Matsuda references cannot anticipate or render obvious the recitations as set forth in amended independent Claim 12. Accordingly, reconsideration and withdrawal of the rejection of Claim 12 are respectfully requested.

Dependent Claims 13-18

The Applicant respectfully submits that the above-identified dependent claims are allowable because the independent claims from which they depend are patentable over the cited references. The Applicant also respectfully submits that the recitations of these dependent claims are of patentable significance.

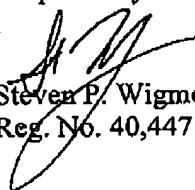
In view of the foregoing, the Applicant respectfully requests that the Examiner withdraw the pending rejections of dependent Claims 13-18.

CONCLUSION

The foregoing is submitted as a full and complete response to the Office Action mailed on June 15, 2005. The Applicant and the undersigned thank Examiner Bello for consideration of these remarks. The Applicant has amended the claims and has submitted remarks to traverse rejections of Claims 12-18. The Applicant respectfully submits that the present application is in condition for allowance. Such action is hereby courteously solicited.

If the Examiner believes that there are any issues that can be resolved by a telephone conference, or that there are any formalities that can be corrected by an Examiner's amendment, please contact the undersigned in the Atlanta Metropolitan area (404) 572-2884.

Respectfully submitted,


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